

Rapid Bioassessment in Wadeable Streams and Rivers by Volunteer Monitors



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SCHEDULE FOR TODAY

WATER QUALITY MONITORING 101

A.M.

YOU WANT US TO DO WHAT????

BREAK INTO TEAMS/RECEIVE EQUIPMENT

SAMPLE YOUR SITE

P.M.

RETURN WITH EQUIPMENT AND DATA

1.) DEP'S WATER QUALITY MONITORING & ASSESSMENTS

2.) NEED FOR VOLUNTEERS

3.) THE PRIMARY WATER QUALITY TOOL

4.) ABOUT RBV

DEP Ambient Monitoring

Requirement of Clean Water Act (305b)

Water Quality Standards

Meet Designated Uses

(Fishable & Swimmable)

ACQUIRE DATA

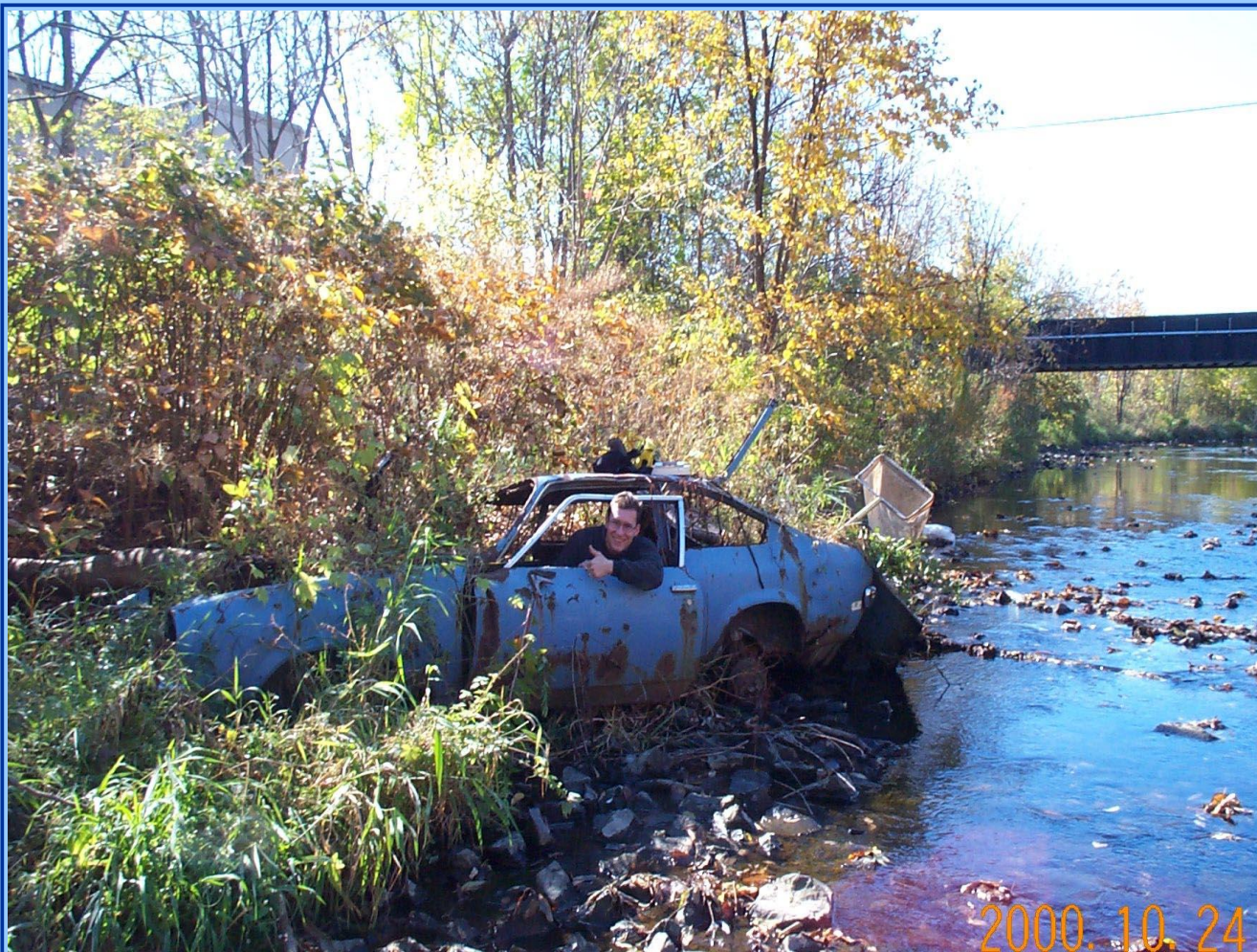
ASSESS DATA

ANALYZE DATA



DEP Ambient Monitoring

Physical, Chemical, Indicator Bacteria



DEP Ambient Monitoring

Benthic Macroinvertebrates



DEP Ambient Monitoring

Fish Community & Tissue Contaminants

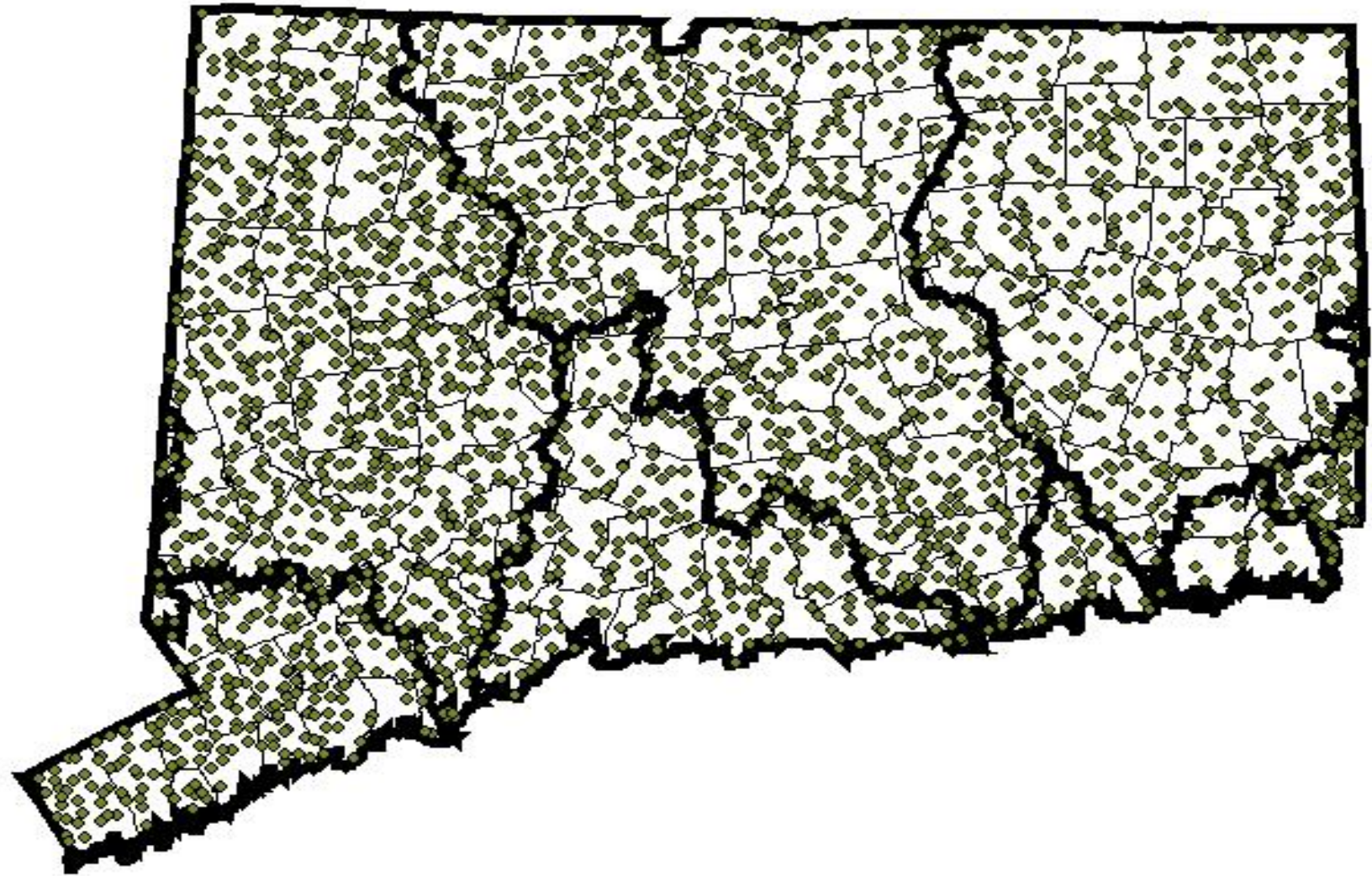


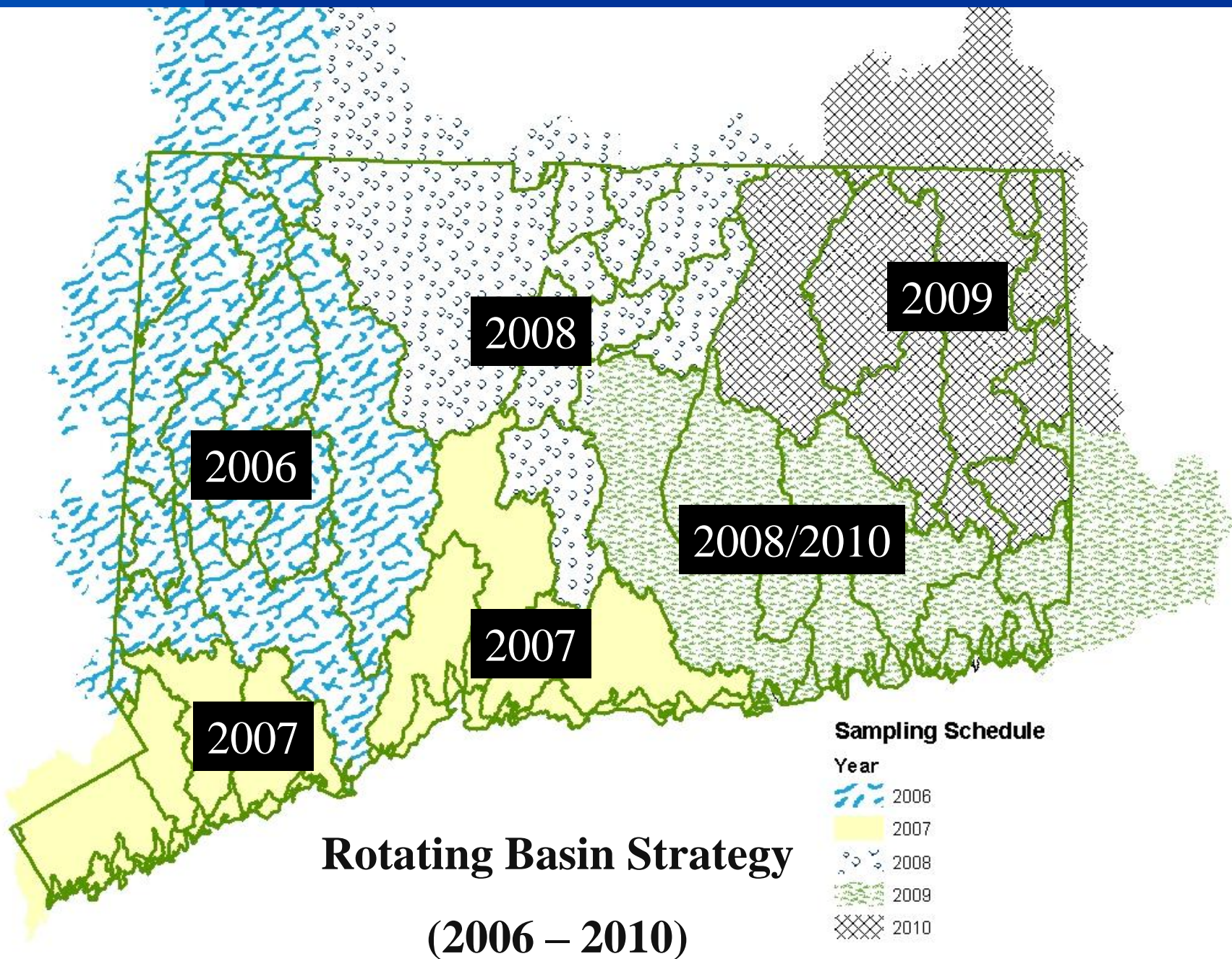
Physical, Chemical, Indicator Bacteria

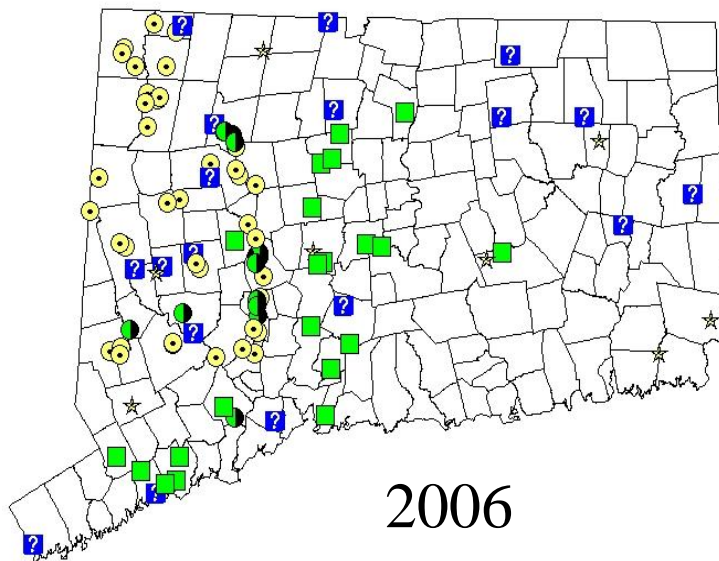
Benthic Macroinvertebrates

DEP Ambient Monitoring

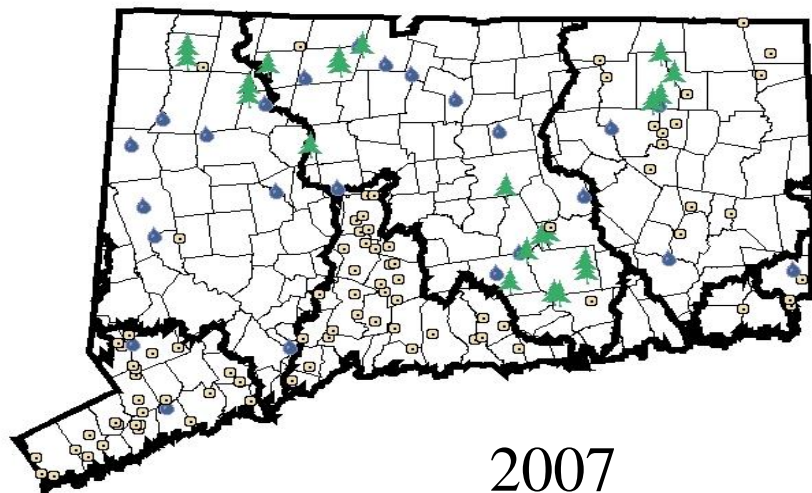
- **Random Sampling Approach**
 - Probabilistic design (60 stations)
- **Targeted Monitoring Approach**
 - **Rotating Basin Strategy**
 - 50 stations
 - Focus on Major Basin for 1 year
 - Quarterly Physical/Chemical/Bacteria
 - Fall Macroinvertebrate
 - **USGS Cooperative Network**
 - 35 stations statewide
phys/chemical/bacteria data 8 times year



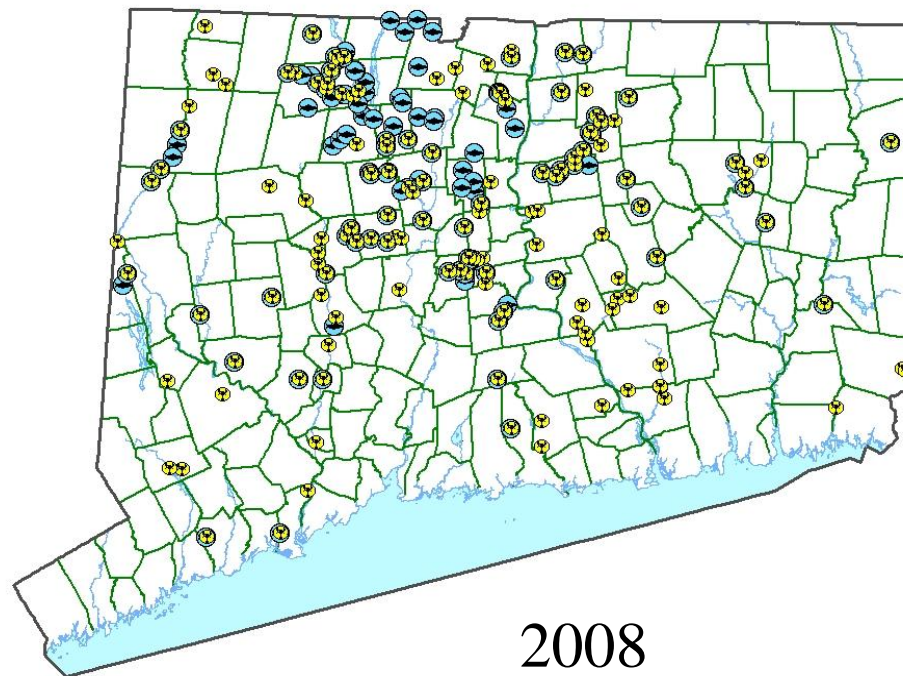




2006

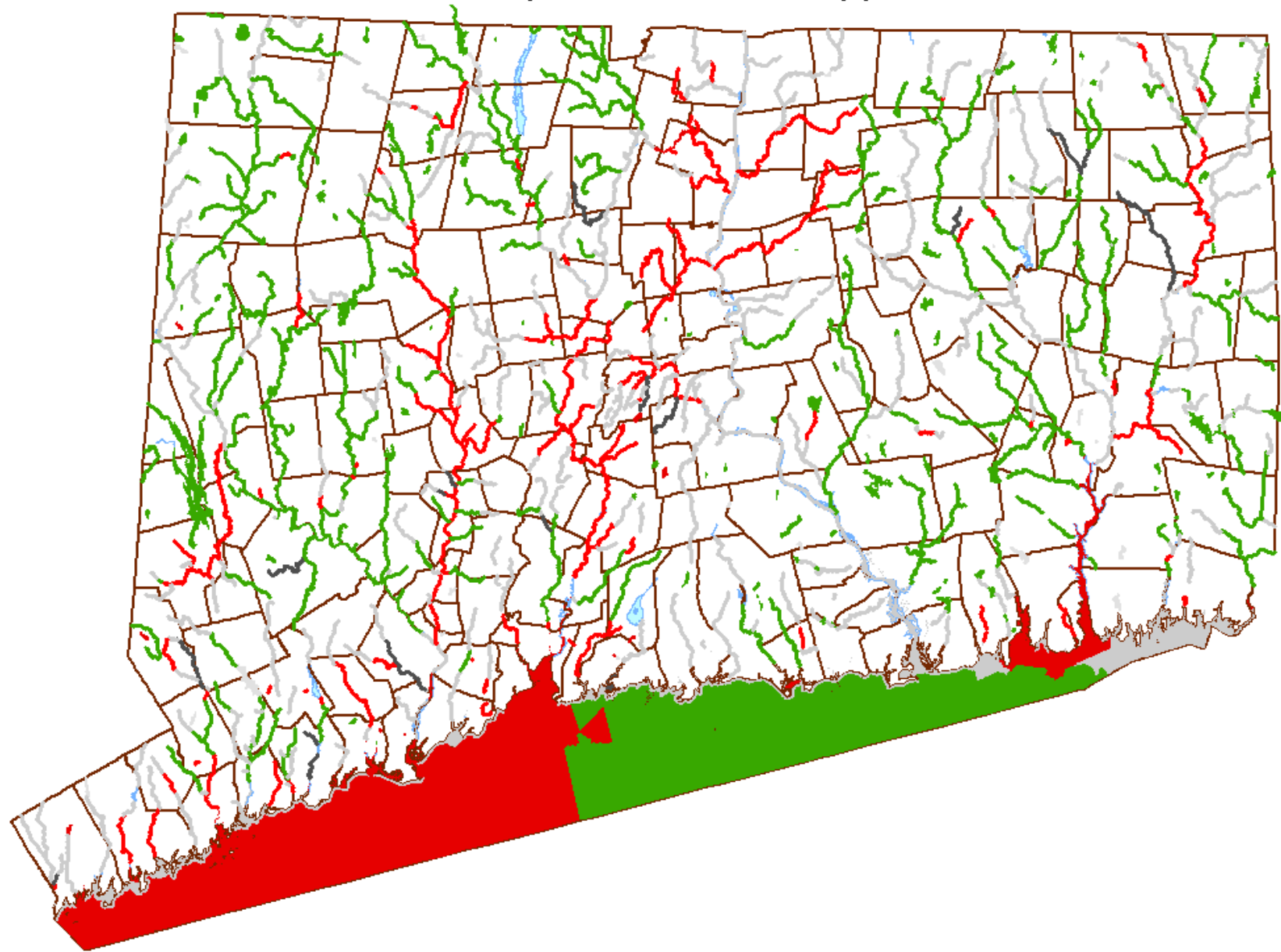


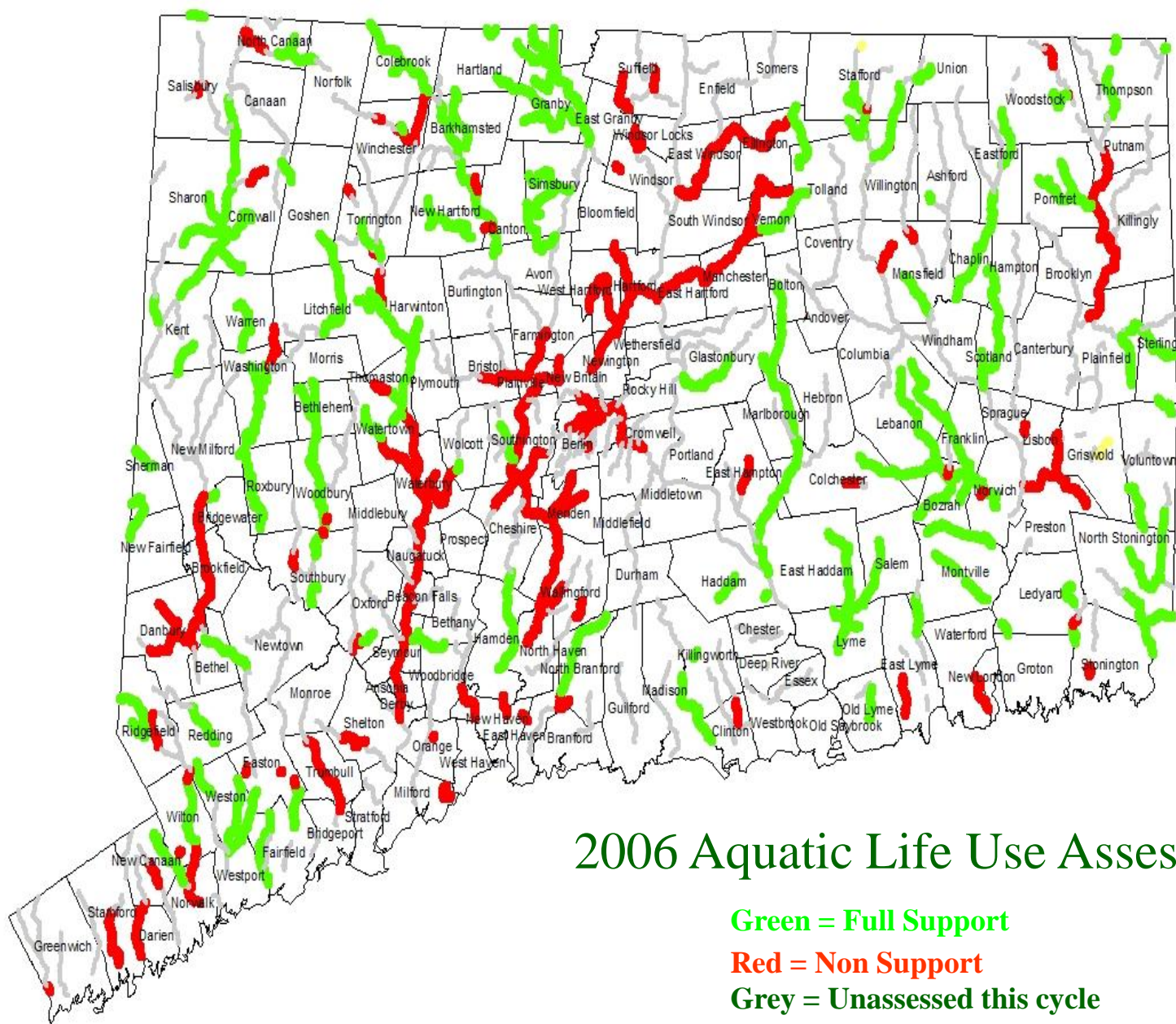
2007

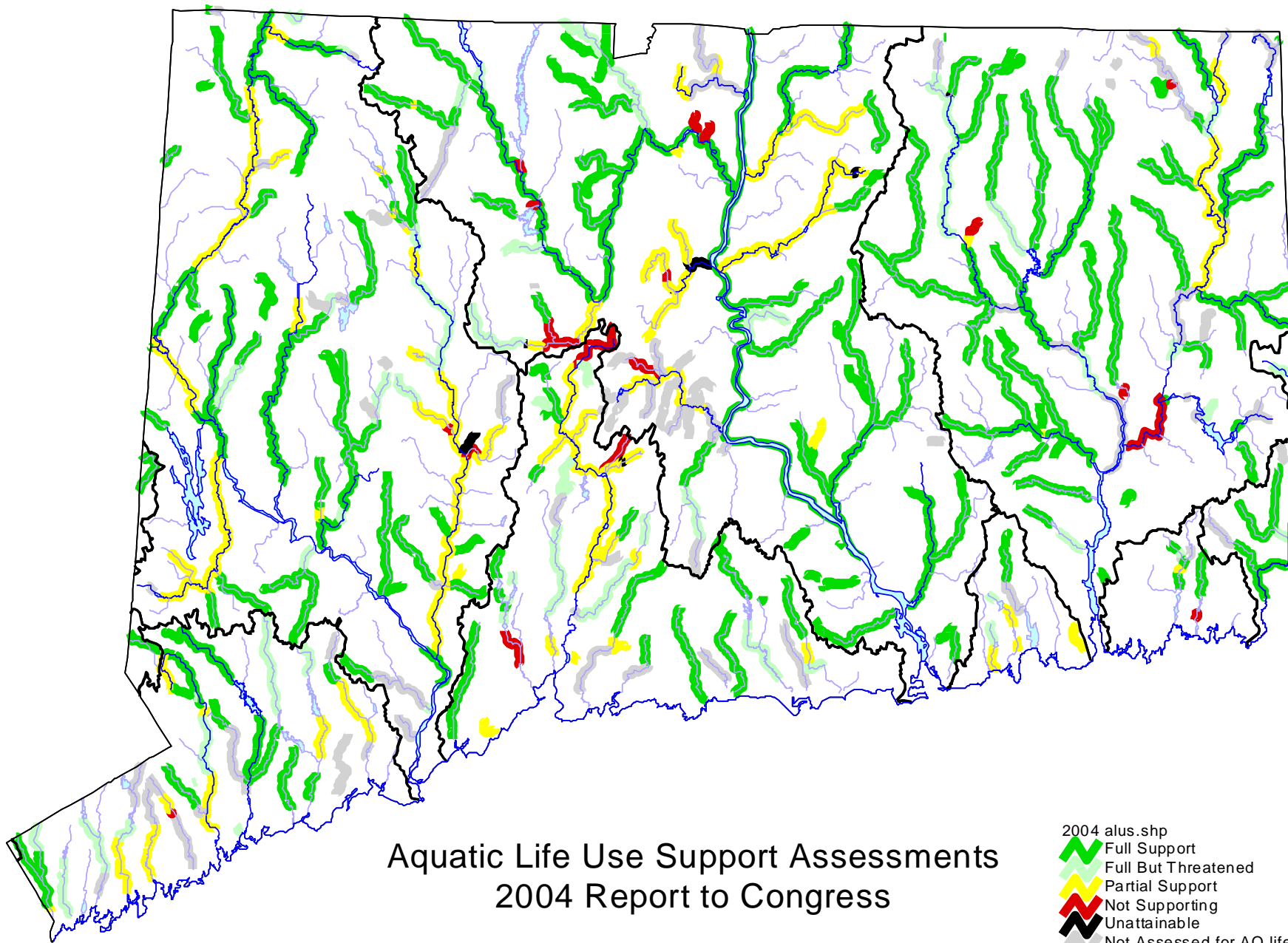


2008

2008 Connecticut Aquatic Life Use Support Assessment







1.) DEP'S WATER QUALITY MONITORING & ASSESSMENTS

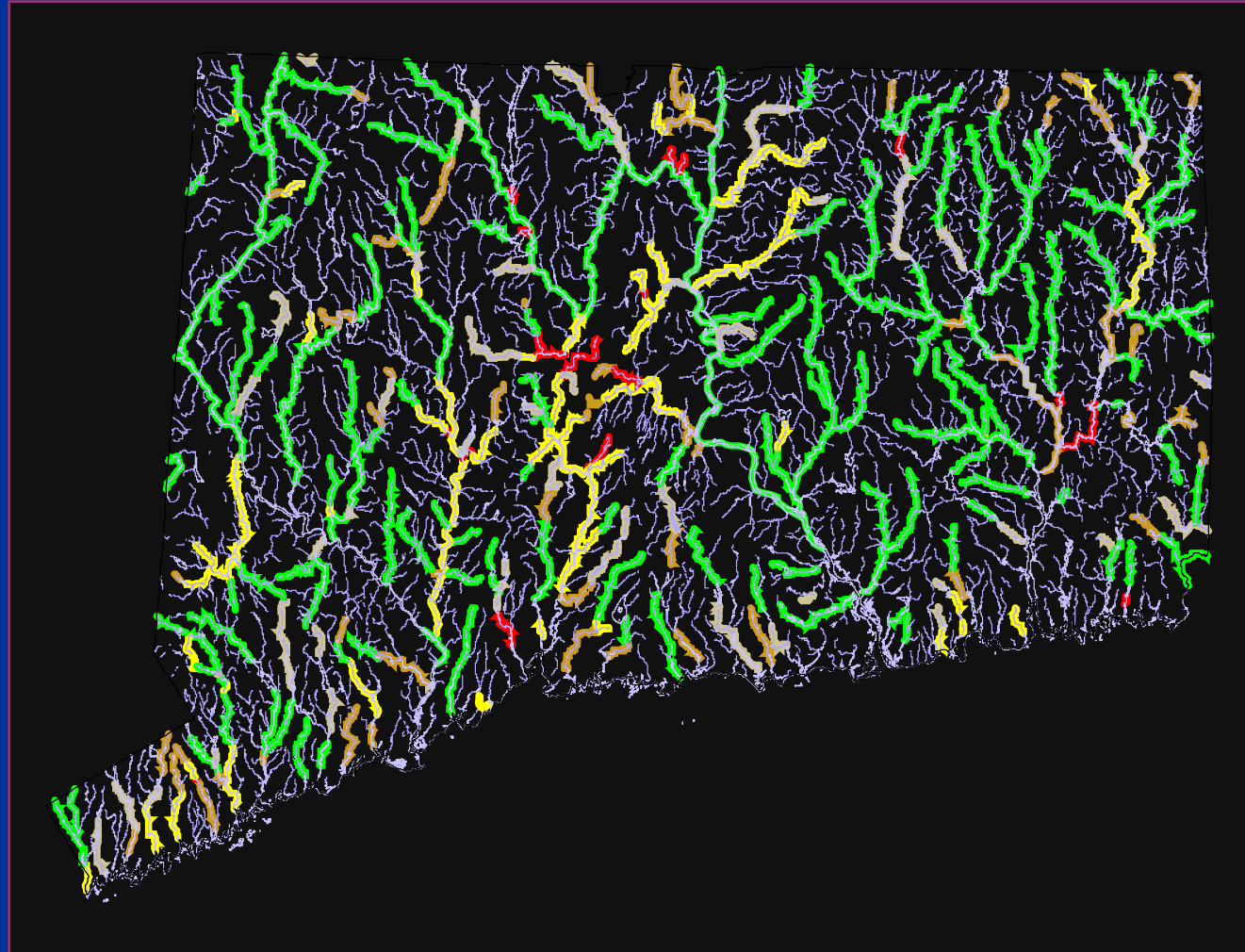
2.) NEED FOR VOLUNTEERS

3.) THE PRIMARY WATER QUALITY TOOL

4.) ABOUT RBV

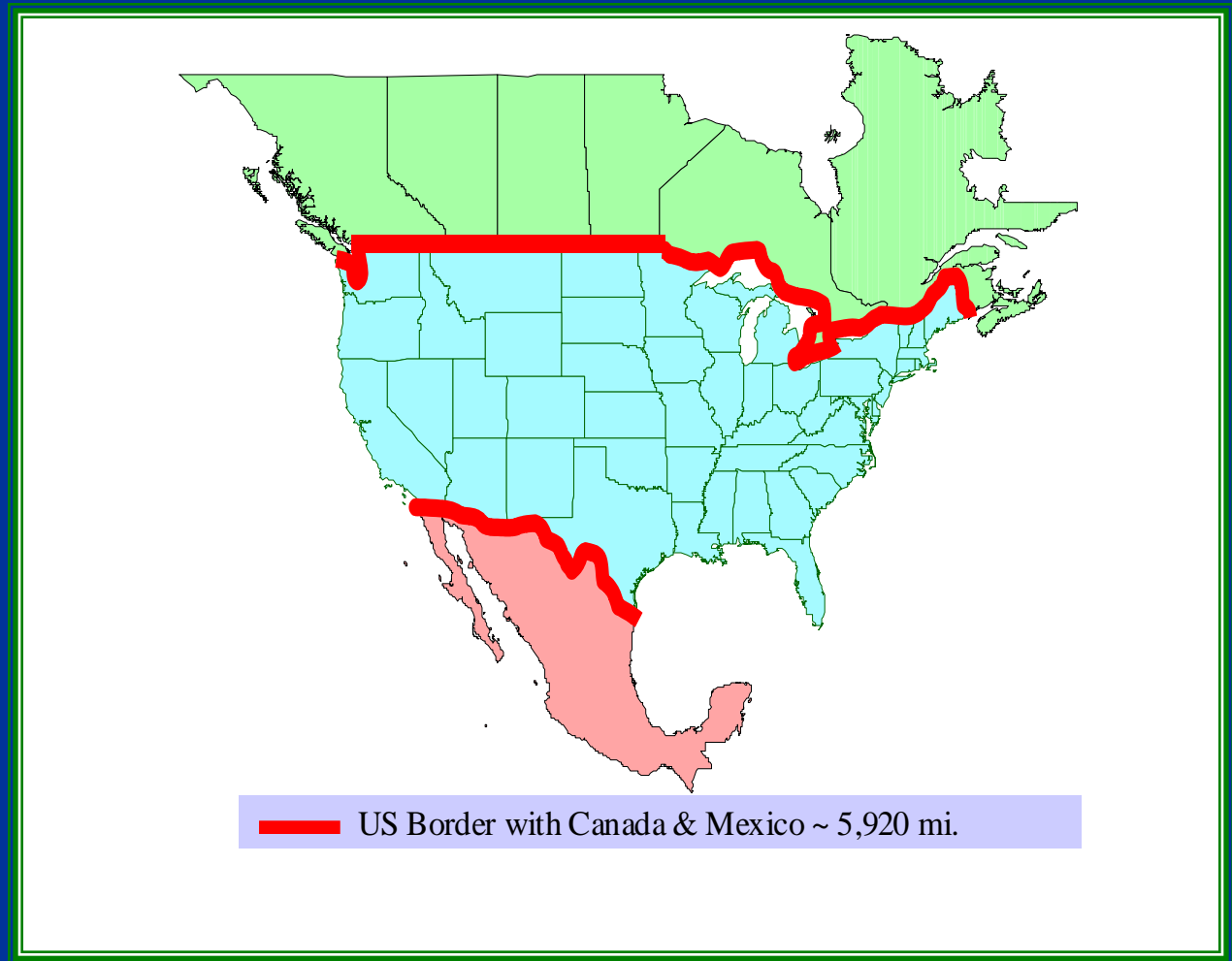
NEED FOR VOLUNTEERS

- **Many areas without Water quality information.**
- Limited staff resources.
- In-touch with local conditions and issues



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1.) DEP'S WATER QUALITY MONITORING

2.) NEED FOR VOLUNTEERS

**3.) THE PRIMARY WATER QUALITY
TOOL**

4.) ABOUT RBV

Riffle-Dwelling

Benthic

Macroinvertebrates

Primary indicator of water quality

- Riffle-Dwelling Benthic Macroinvertebrates
- Rapid Bioassessment Protocol #3
- Very technical & extensive time commitment



For More Information About Rapid Bioassessment Protocols...

<http://www.epa.gov/OWOW/monitoring/>

Riffle-Dwelling

Benthic

Macroinvertebrates



Riffle-Dwelling

10. 13. 1999

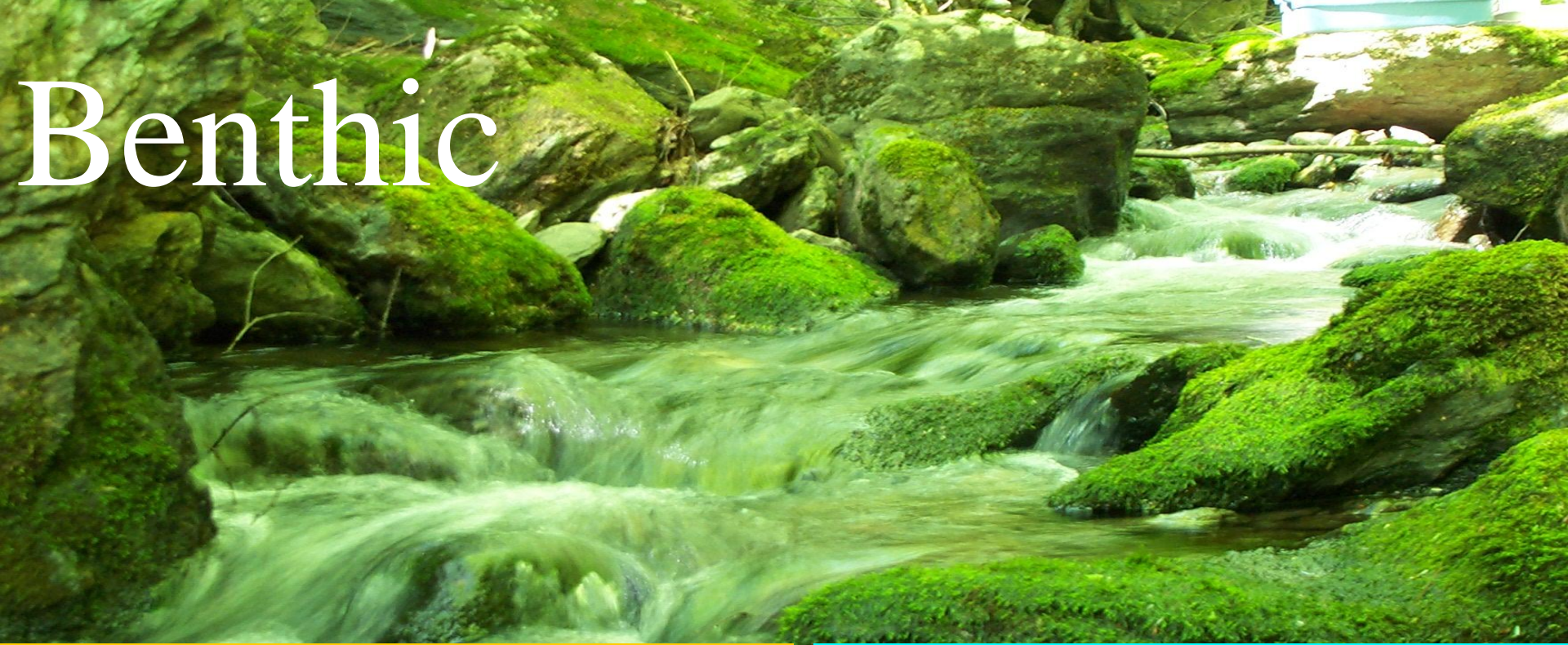


Riffle-Dwelling

Benthic

Macroinvertebrates

Benthic



Riffle-Dwelling

Benthic

Macroinvertebrates

Macroinvertebrate



Riffle-Dwelling Benthic Macroinvertebrates

RIFFLE-DWELLING: A *riffle* is a section of a stream or river characterized by rapid turbulent flow, has a stable rocky substrate, and is wadeable most of the time. Other major stream habitats are pools and runs/glides.

Dwelling means living at least part of their life cycle within the riffle habitat.

BENTHIC: Living in or on the substrate (bottom) of an aquatic environment.

MACRO: Large enough to be seen with the unaided eye. The US EPA further defines a macro-organism as one retained by a US Standard Number 30-mesh sieve (0.595-mm openings).

INVERTEBRATE: An animal without a backbone.



Macroinvertebrates and Water Quality

- Live in wide range of water quality.
- Characteristic responses to environmental stresses.
- Established methodologies.
- Ease of capture.
- Rapid recovery from repeat sampling.
- Life history/Limited mobility.

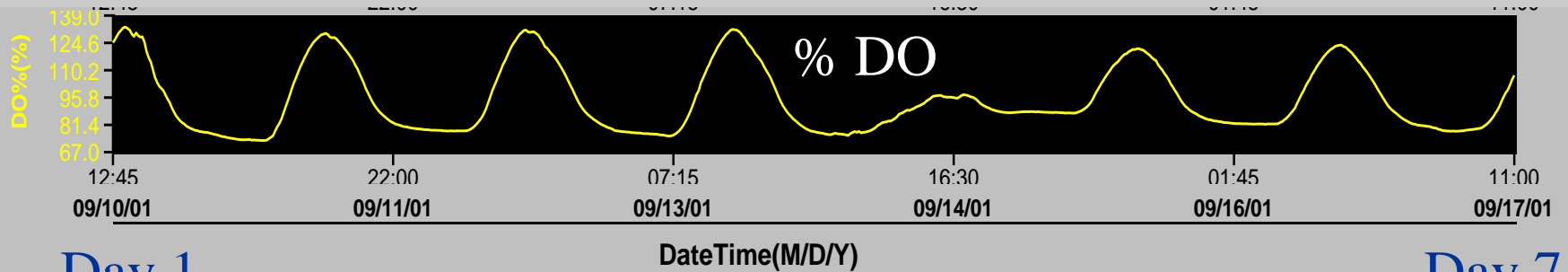
Temp

Cond

DO

DEPTH

pH



Day 1

Day 7

1.) DEP'S WATER QUALITY MONITORING

2.) NEED FOR VOLUNTEERS








3.) THE PRIMARY WATER QUALITY TOOL

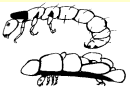




4.) ABOUT RBV








Purpose of the RBV Program




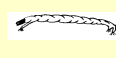



- To **ENCOURAGE** volunteer monitoring of wadeable streams.
- To have an **EASY, QUICK, & EFFICIENT** method.
- **CONFIDENCE** in the data for use by BOTH the participant and the DEP.


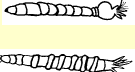


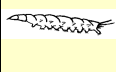


WATERBODY NAME:				COLLECTION DATE:		COLLECTION TIME:	
LOCATION DESCRIPTION:				COLLECTORS NAMES:			
TOWN:				NOTES/COMMENTS:			

MOST	1 Body builder mayfly <i>Drunella</i>	2 Minnow mayfly <i>Isonychia</i>	3 2-tailed flat head mayfly <i>Epeorus</i>	4 Roach-like stonefly <i>Plecoptera</i>	5 A Common stonefly <i>Perlidae</i>	5 B Giant stonefly <i>Pteronarcys</i>	5 C Misc Stonefly
							
	Locs 1&2						
	Locs 3&4						
Locs 5&6							

MOST	6 A Saddle-Case caddis <i>Glossosoma</i>	6 B Cornucopia Case caddis <i>Apatania</i>	7 Michelin Man caddis <i>Rhyacophila</i>	8 A Mid-size plant case caddis <i>Brachycentrus</i>	8 B <i>Lepidostoma</i>	DATA INTERPRETATION # OF TYPES OF THE "MOST" WATER QUALITY 5 OR MORE EXCEPTIONAL 3 TO 4 EXCELLENT 1 TO 3 VERY GOOD 0 MORE INFO NEEDED TO ASSESS
						
	Locs 1&2					
	Locs 3&4					
Locs 5&6						

MODERATE	9 Common net-spinner <i>Hydropsychidae</i>	10 Fingernet Caddis <i>Chimarra</i>	11 Flat Head mayfly <i>Stenonema</i>	12 Water Penny <i>Psephenus</i>	13 A Dobsonfly <i>Corydalus</i>	13 B Fishfly <i>Nigronia</i>	14 Dragonfly & Damselfly <i>Odonata</i>
							
	Locs 1&2						
	Locs 3&4						
Locs 5&6							

LEAST	15 A Amphipod	15 B Isopod	15 C Leech	15 D Midge	15 E Black fly	15 F Snail	15 G Worm
							
	Locs 1&2						
	Locs 3&4						
Locs 5&6							

OTHERS	OTHER COMMONLY COLLECTED RIFFLE-DWELLING MACROINVERTEBRATES						
	Crayfish	Crane fly larvae	Riffle Beetle adult/larva	Small minnow mayfly	Water snipe fly	Planaria	Fingernail clam/mussel
							
	Present						

To Make the List

1.) Statewide Distribution



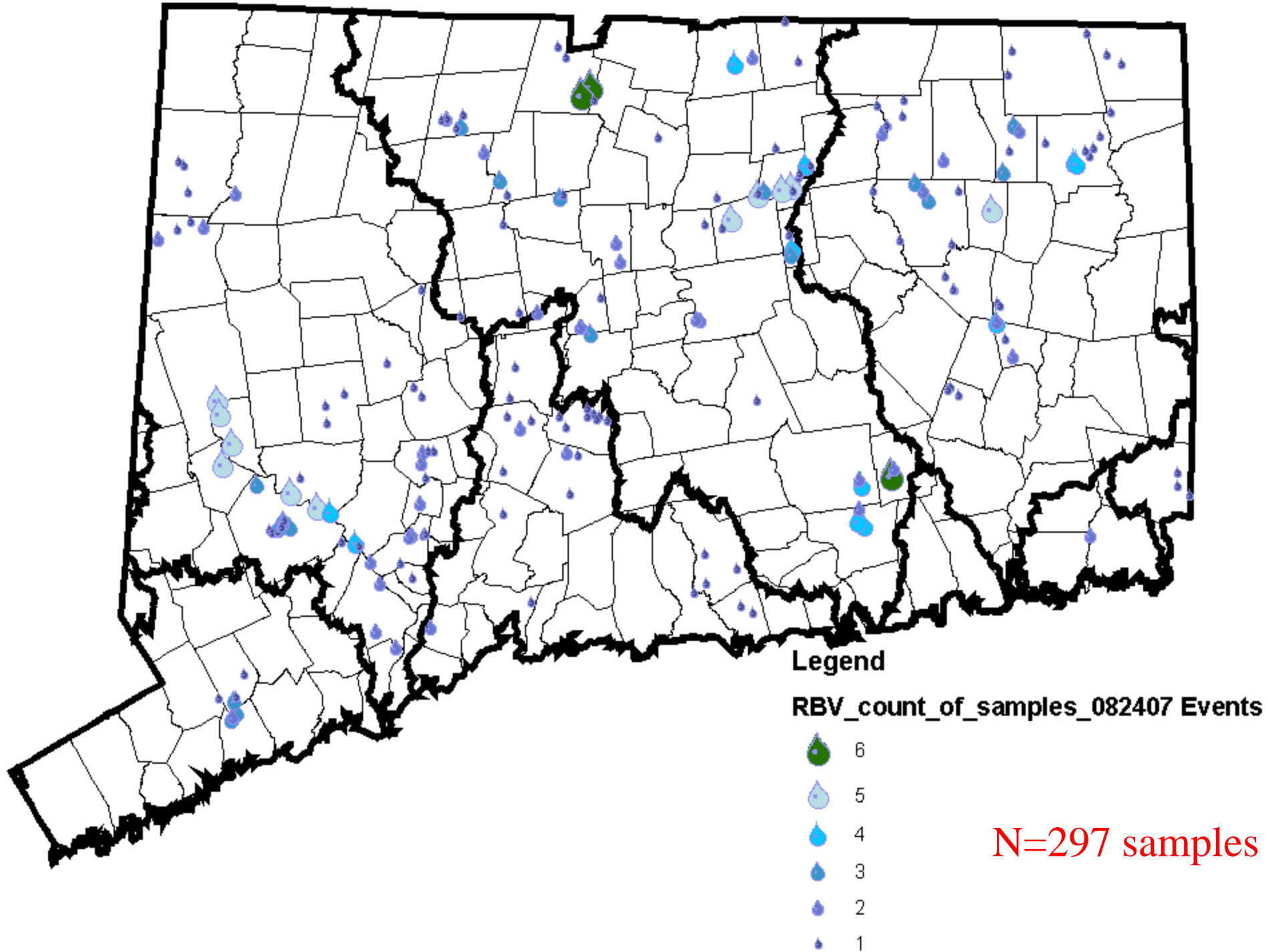
2.) Fun



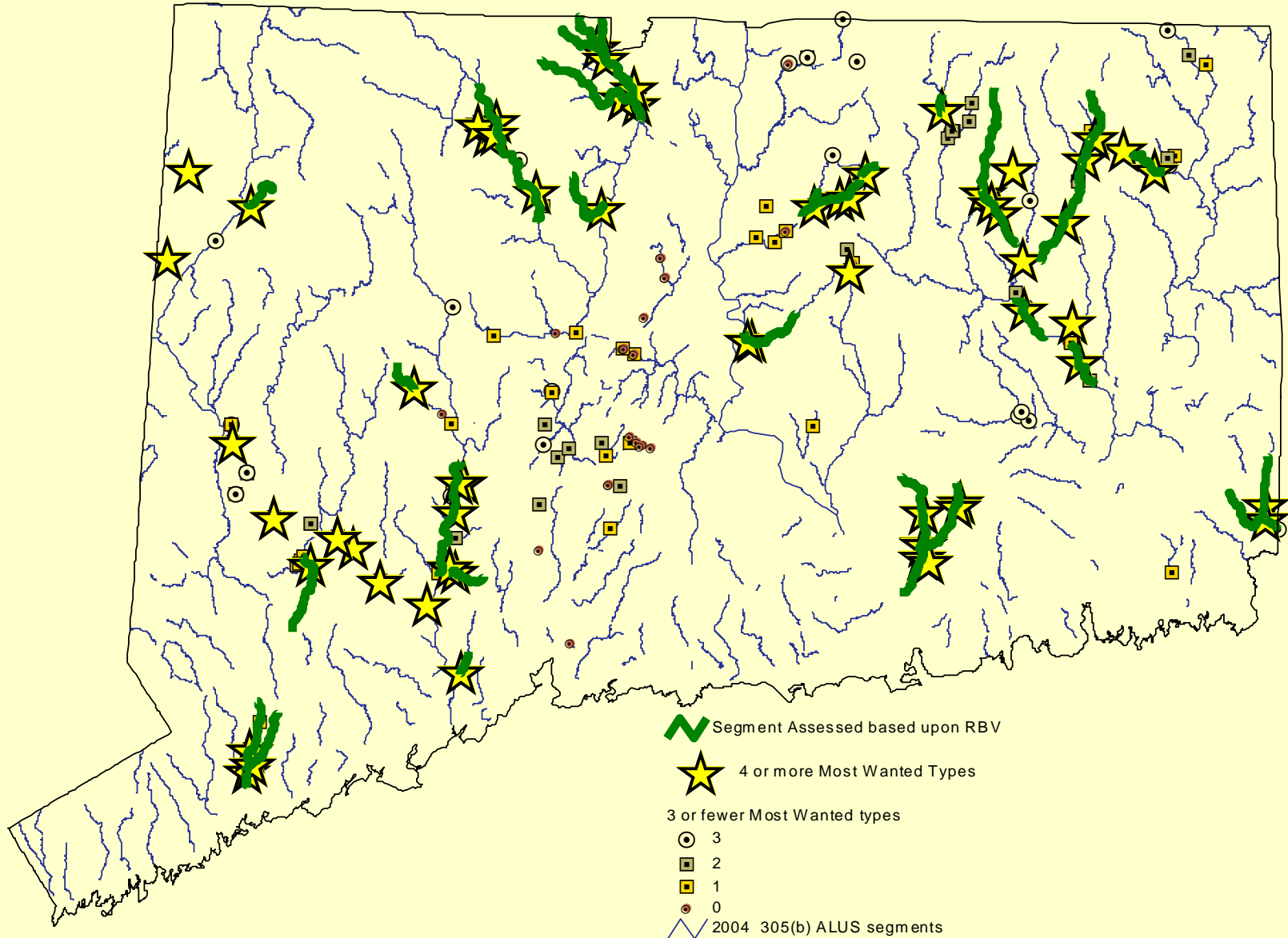
3.) Key Ecological Indicator

How can the data be used?

- **Screen for Very High or Very Low Water Quality.**
- **Document Baseline Conditions.**
- **Provide Additional Information.**
- **Compare Stream Reaches.**
- **Evaluate Potential Water Quality Concern.**



Additional segments assessed as fully supporting for aquatic life use based on the presence of 4 or more "Most Wanted Types". The samples were collected by volunteer monitors following the RBV protocol.



The presence of a trout in a body of water is a discrete ecological fact that nevertheless signifies certain things.



...a particular complex of biotic and chemical and physical factors
a standard of richness and purity, without which that troutly presence
is impossible....David Quammen



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